

Appl. No. 10/750,512  
Reply to Office Action of June 29, 2005

### REMARKS

In the June 29, 2005 Office Action, claims 1-66 were rejected. Applicant respectfully declines to amend the claims at this time. Reconsideration of the application is respectfully requested in view of the following remarks.

Claims 1-2, 4-28, 30-35, 37-61, and 63-66 stand rejected under 35 U.S.C. §102(a) as being anticipated by Cusumano et al., USPN 6,567,752 (hereinafter "Cusumano"). Applicant traverses this rejection. Of the claims rejected under §102(a), only claims 1 and 34 are independent. Claim 1 is representative, and the following comments also apply to claim 34 unless otherwise noted.

As best understood, Cusumano discloses a technique for monitoring the evolution of slow-to-develop damage in machinery components, and for predicting the remaining useful life of such components. The Office Action contends that Cusumano teaches the use of a plurality of proximeters that measure resonant vibration frequency and amplitude data derived from a transit time between individual rotating extensions, along with signal amplitude data (the Office Action cites to Cusumano at Column 12, Lines 57-62 in support of this proposition). Cusumano, however, does not teach or suggest the derivation of data in this manner. Should the Examiner decide to maintain this rejection, Applicant would appreciate a further explanation of how Cusumano allegedly teaches the measurement of "resonant vibration frequency and amplitude data derived from a transit time between said individual rotating extensions, along with signal amplitude data" as recited in claims 1 and 34.

Claims 2, 4-28, and 30-33 variously depend from claim 1, and claims 35, 37-61, and 63-66 variously depend from claim 34. Therefore, these claims are not anticipated by Cusumano for at least the reasons discussed above. Furthermore, Cusumano fails to teach or suggest many of the limitations recited in these dependent claims. These additional shortcomings of Cusumano are listed below.

Regarding claims 4 and 37, Cusumano, and the cited passage at Column 4, Lines 35-42 in particular, does not teach or suggest that the measured resonant vibration data "includes radial runout data for said shaft" as claimed. Should the Examiner decide to maintain the rejection of claims 4 and 37, Applicant would appreciate a further explanation of how Cusumano allegedly teaches the recited limitation.

Appl. No. 10/750,512  
Reply to Office Action of June 29, 2005

Regarding claims 5, 38, and 41, Cusumano, and the cited passage at Column 3, Lines 25-30 in particular, does not teach or suggest that the "radial runout data indicates radial positions of said teeth" as claimed. Should the Examiner decide to maintain the rejection of claims 5, 38, and 41, Applicant would appreciate a further explanation of how Cusumano allegedly teaches the recited limitation.

Regarding claims 6 and 39, Cusumano, and the cited passage at Column 4, Lines 31-42 in particular, does not teach or suggest that the "processor correlates said resonant vibration data and radial runout data for said shaft" as claimed. Should the Examiner decide to maintain the rejection of claims 6 and 39, Applicant would appreciate a further explanation of how Cusumano allegedly teaches the recited limitation.

Regarding claim 7, Cusumano, and the cited passage at Column 12, Lines 58-65 in particular, does not teach or suggest that the "proximeters further measure and transmit axial movement data for said shaft" as claimed. Should the Examiner decide to maintain the rejection of claim 7, Applicant would appreciate a further explanation of how Cusumano allegedly teaches the recited limitation.

Regarding claim 8, Cusumano, and the cited passage at Column 3, Lines 22-31 in particular, does not teach or suggest that the "proximeters further measure and transmit axial movement data" as claimed. Should the Examiner decide to maintain the rejection of claim 8, Applicant would appreciate a further explanation of how Cusumano allegedly teaches the recited limitation.

Regarding claims 9 and 40, Cusumano, and the cited passage at Column 4, Lines 31-42 in particular, does not teach or suggest that the "processor correlates said resonant vibration data and axial movement data for said shaft" as claimed. Should the Examiner decide to maintain the rejection of claims 9 and 40, Applicant would appreciate a further explanation of how Cusumano allegedly teaches the recited limitation.

Regarding claims 11 and 44, Cusumano, and the cited passage at Column 3, Lines 30-31 in particular, does not teach or suggest that the "proximeters are capacitive proximeters" as claimed. Should the Examiner decide to maintain the rejection of claims 11 and 44, Applicant would appreciate a further explanation of how Cusumano allegedly teaches the recited limitation.

Appl. No. 10/750,512  
Reply to Office Action of June 29, 2005

Regarding claims 12 and 13, Cusumano, and the cited passage at Column 8, Lines 16-18 in particular, does not teach or suggest that the "proximeters are optical proximeters" as claimed. Should the Examiner decide to maintain the rejection of claims 12 and 13, Applicant would appreciate a further explanation of how Cusumano allegedly teaches the recited limitation.

Regarding claims 14 and 47, Cusumano, and FIG. 2 in particular, does not teach or suggest that the measurement of "non-duplicative resonant vibration and amplitude data for each of said rotating extensions along with signal amplitude data for said multiple rotating machinery components" as claimed. Should the Examiner decide to maintain the rejection of claims 14 and 47, Applicant would appreciate a further explanation of how Cusumano allegedly teaches the recited limitation.

Regarding claims 17 and 50, Cusumano, and the cited passage at Column 3, Lines 25-30 in particular, does not teach or suggest that "at least one of the proximeters is disposed at a location approximately 180° from said meshing point" of two gears as claimed. Should the Examiner decide to maintain the rejection of claims 17 and 50, Applicant would appreciate a further explanation of how Cusumano allegedly teaches the recited limitation.

Regarding claims 18 and 51, Cusumano, and FIG. 2 in particular, does not teach or suggest a housing having a wall that separates the proximeters from the rotating machinery as claimed. Rather, the system shown in FIG. 2 depicts a strain gauge coupled directly to the object under test (identified by reference number 205), and there is no housing surrounding the object under test. Should the Examiner decide to maintain the rejection of claims 18 and 51, Applicant would appreciate a further explanation of how Cusumano allegedly teaches the recited limitation.

Regarding claims 19 and 52, Cusumano, and FIG. 2 in particular, does not teach or suggest a housing having a wall with "a blind hole extending partially through said wall in which one of said electromagnetic proximeter is disposed" as claimed. Should the Examiner decide to maintain the rejection of claims 19 and 52, Applicant would appreciate a further explanation of how Cusumano allegedly teaches the recited limitation.

Regarding claims 20 and 53, Cusumano, and FIG. 2 in particular, does not teach or suggest that "at least one of said proximeters is exposed to said rotating machinery" as claimed.

Appl. No. 10/750,512  
Reply to Office Action of June 29, 2005

Rather, the system shown in FIG. 2 depicts a non-rotating object under test (identified by reference number 205). Should the Examiner decide to maintain the rejection of claims 20 and 53, Applicant would appreciate a further explanation of how Cusumano allegedly teaches the recited limitation.

Regarding claims 25 and 58, Cusumano, and the cited passage at Column 3, Lines 27-30 in particular, does not teach or suggest the use of predetermined values that comprise "values for a radial gap between a gear tooth and a housing in which said gear tooth is housed" as claimed. Should the Examiner decide to maintain the rejection of claims 25 and 58, Applicant would appreciate a further explanation of how Cusumano allegedly teaches the recited limitation.

Regarding claims 32 and 65, Cusumano, and the cited passage at Column 13, Lines 35-38 in particular, does not teach or suggest that the "processor is configured to assess lubricity degradation for said rotating machinery based on said machinery chatter" as claimed. Should the Examiner decide to maintain the rejection of claims 32 and 65, Applicant would appreciate a further explanation of how Cusumano allegedly teaches the recited limitation.

Regarding claims 33 and 66, Cusumano, and the cited passage at Column 3, Lines 27-30 in particular, does not teach or suggest that the "proximeters are spaced at odd harmonics of the resonance frequency quarter wavelength of said teeth" as claimed. Should the Examiner decide to maintain the rejection of claims 33 and 66, Applicant would appreciate a further explanation of how Cusumano allegedly teaches the recited limitation.

For at least the above reasons, claims 1-2, 4-28, 30-35, 37-61, and 63-66 are not anticipated by Cusumano, and Applicant requests the withdrawal of the §102(a) rejection of those claims.

Claims 3, 29, 36, and 62 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Cusumano in view of Discenzo, USPN 6,847,854 (hereinafter "Discenzo"). Applicant respectfully traverses this rejection.

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation to modify a reference or to combine the teachings of multiple references. Second, there must be a reasonable expectation of success. Third, the prior art must teach or suggest all of the recited claim limitations. Of course, the teaching or

Appl. No. 10/750,512  
Reply to Office Action of June 29, 2005

suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in Applicant's disclosure. Applicant respectfully submits that the Examiner has not met all of the above criteria.

Claims 3 and 29 variously depend from independent claim 1, and claims 36 and 62 variously depend from independent claim 34. For the reasons discussed above, Cusumano neither teaches nor suggests all of the limitations of claims 1 and 34, as alleged by the Office Action. Moreover, the Discenzo disclosure does not compensate for the shortcomings of Cusumano. Indeed, the proposed combination of Cusumano and Discenzo fails to teach or suggest all of the limitations recited in claims 3, 29, 36, and 62.

For at least the above reasons, claims 3, 29, 36, and 62 are not unpatentable over Cusumano in view of Discenzo, and Applicant respectfully requests the withdrawal of the §103(a) rejection of those claims.

In conclusion, for the reasons given above, all claims now presently in the application are believed allowable and such allowance is respectfully requested. Should the Examiner have any questions or wish to further discuss this application, Applicants request that the Examiner contact the undersigned attorney at (480) 385-5060.

If for some reason Applicants have not requested a sufficient extension and/or have not paid a sufficient fee for this response and/or for the extension necessary to prevent abandonment on this application, please consider this as a request for an extension for the required time period and/or authorization to charge Deposit Account No. 50-2091 for any fee which may be due.

Respectfully submitted,

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